

## **SECTION 02280**

### **BIOINTRUSION BARRIER**

#### **PART 1 GENERAL**

##### **1.01 SCOPE**

- A. This Section includes biointrusion barrier and choke stone products and placement.

##### **1.02 RELATED SECTIONS AND PLANS**

- A. Section 02100 - Surveying
- B. Section 02200 - Earthwork
- C. Section 02710 - Granular Drainage Material
- D. Part 8 - Environmental Health and Safety, and Training Requirements
- E. Part 9 - Quality Assurance Requirements

##### **1.03 REFERENCES**

- A. Latest version of American Society for Testing and Materials (ASTM) Standards.
  - 1. ASTM C 127. Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
  - 2. ASTM C 136. Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. *"Off-Site Borrow Materials-Geotechnical Evaluation Report"*, (Revision 0), prepared by Parsons, June 1996. This report presents geotechnical data for potential off-site borrow sources for OSDF construction materials, including fine and coarse concrete aggregates, pea gravel, and riprap.

## **1.04 SUBMITTALS**

- A. For each source of biointrusion barrier material, submit the following to the Construction Manager within 60 calendar days from Notice to Proceed for review:
  - 1. the source of the biointrusion barrier material; and
  - 2. certification from the supplier that the biointrusion barrier material meets the material requirements of this Section to include test results conducted on representative biointrusion barrier samples in accordance with ASTM C 127 and ASTM C 136.
- B. For each source of choke stone, submit the following to the Construction Manager within 60 calendar days from Notice to Proceed for review:
  - 1. the source of the choke stone;
  - 2. certification from the supplier that the choke stone meets the material requirements of this Section to include test results conducted on each of three choke stone samples in accordance with ASTM C 136, and ASTM C 127; and
  - 3. a 50-pound representative sample of the material.
- C. After submitting the above, coordinate with the Construction Manager and CQC Consultant and arrange a visit to the proposed source for biointrusion barrier material. The Construction Manager and CQC Consultant may go to the source to visually observe the proposed material and the methods used to achieve the required material gradation.
- D. Include list of equipment and description of construction methods to be used for biointrusion barrier construction in the Earthwork Work Plan specified in Section 02200.

## **1.05 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental, health and safety, and other training requirements shall be as specified in Part 8 of the Contract Documents.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Furnish biointrusion barrier material consisting of field stone, rough unhewn quarry stone, or excavated rock with angular or fractured faces.

- B. Furnish biointrusion barrier material free of deleterious material. Biointrusion barrier material smaller than a 6-inch square opening shall consist of rock spalls and rock fines.
- C. Furnish biointrusion barrier material that meets the following gradation requirements (per ASTM C 136):
  - 1. maximum dimension of 18 inches;
  - 2. minimum of 85 percent of the material, by weight, larger than a 6-inch, but less than or equal to an 18-inch, square opening;
  - 3. minimum of 50 percent of the material, by weight, larger than a 12-inch square opening;
  - 4. fraction smaller than a 1-inch square opening comprises less than 1 percent by total weight; and
  - 5. the material has a particle size for which 15 percent of the particles are finer ( $d_{15}$ ) are in the range of 6 to 14 inches.
- D. Furnish biointrusion barrier choke stone having a gradation that meets the following requirements (per ASTM C 136):

<u>Sieve</u>	<u>Total Percent Passing</u>
4 in.	100
3 1/2 in.	90 to 100
2 1/2 in.	25 to 60
1 1/2 in.	0 to 15
3/4 in.	0 to 5

- E. Furnish biointrusion barrier material and choke stone having a minimum bulk specific gravity of 2.60 and a maximum absorption of 0.83 percent in accordance with ASTM C 127.

## **2.02 EQUIPMENT**

- A. Furnish equipment necessary to load, haul, place, spread, and compact biointrusion barrier and choke stone materials.
- B. Furnish steel drum (smooth or padded) vibratory compactor capable of delivering a dynamic force of 25,000 lbs ( $\pm 15$  percent).

## **PART 3 EXECUTION**

### **3.01 MATERIAL PLACEMENT**

- A. Place biointrusion barrier material to the thicknesses, elevations, and locations shown on the Construction Drawings. Place biointrusion barrier material above granular cover drainage material constructed in accordance with Section 02710.
- B. Place biointrusion barrier material on top of the cover drainage layer as shown on the Construction Drawings. Avoid damage of the underlying material. Maximum acceptable free-fall height of material during placement is 3 feet.
- C. Place the biointrusion barrier material in such a manner as to produce a uniform mass with the minimum practicable percentage of voids. Place so that the larger pieces are distributed throughout the entire mass. Hand placing, to a limited extent, may be required, but only to the extent necessary to obtain these results.
- D. Place biointrusion barrier material from the toe of the slope and work upslope.
- E. Do not place the biointrusion barrier material by dumping into chutes or by similar methods likely to cause segregation of various sizes.
- F. Place the choke stone as a separate layer. Spread choke stone using a tracked dozer. Initially work the choke stone into the biointrusion barrier by multiple passes of the dozer. Work choke stone into at least the top 6 inches of the biointrusion barrier by at least four passes of the vibratory compactor specified in this Section.

### **3.02 CONSTRUCTION QUALITY REQUIREMENTS**

- A. CQC Consultant will perform conformance testing of the choke stone material to establish compliance with this Section. Conformance testing to be performed and the testing frequencies are given in the Construction Quality Assurance Plan referenced in Part 9 of the Contract Documents.

### **3.03 SURVEY CONTROL**

- A. Survey the limits and elevations of the top of the biointrusion barrier prior to placing choke stone in accordance with Section 02100.

- B. Survey the limits and elevations of the top of biointrusion barrier with choke stone in accordance with Section 02100.

### **3.04 CONSTRUCTION TOLERANCE**

- A. Construct the biointrusion barrier to within -0.1 to +0.3 feet of the thickness shown on the Construction Drawings.
- B. Construct the biointrusion barrier with choke stone to within 0.0 to +0.5 feet of the elevations indicated on the Construction Drawings.

[END OF SECTION]